

AN INTERVIEW WITH DR. ROB NACZI
ABOUT *SARRACENIA ROSEA*

TIM STEVENS • 4436 Blackwood Drive • Montgomery, AL 36109-3159 • USA •
tstevens1954@mindspring.com

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The following text is excerpted from an interview conducted by Tim Stevens on 2 October 2000. Stevens requested the interview from Robert Naczi in order to learn more about the circumstances surrounding the description of *Sarracenia rosea* as a new species (Naczi et al. 1999), as well as its conservation. Prior to the publication of this paper by Naczi, Eric Soper, Frederick Case, and Roberta Case, the plant was known as *S. purpurea* subsp. *venosa* var. *burkii*.

At the time of the interview, Naczi was an associate professor at Northern Kentucky University. Since that time, he has moved to Delaware State University, where he is curator of the Claude E. Phillips Herbarium.

Q: How did you become involved in studying *Sarracenia rosea*?

RN: It's actually an interesting story. It might not be exactly what most people would suspect but I'm very interested in the whole community of arthropods that live inside pitcher plants. There are some mites and insects that are actually able to survive the plant. Most, as you know, get trapped and digested by pitcher plants but there are some that live inside these pitchers and they live nowhere else. I'm speaking of *Sarracenia* pitchers generally.

So I began a project as an undergraduate. I was looking at the mites that live inside these pitchers and I was really fortunate to get a small grant and to make a trip south in 1984. George Folkerts and some other folks from Auburn University helped me a lot on that trip. So, they introduced me to these plants that I hadn't seen. I'd seen the northern purple pitcher plant but not this southern thing. Then, when I entered graduate school, I did not pursue pitcher plants or their mites for my doctoral research, but I did work on a group of plants that allowed me to do field work in the southeastern United States. So I continued to collect from pitcher plants and I did that in graduate school. I realized that the northern purple pitcher plant looked quite a bit different to me than this plant on the Gulf Coast. So really, to make a long story short, it was because of my work on the mites that live inside these plants that I was taking a closer look at the plants themselves.

The more I worked on this the more I got interested in the plants themselves. I had started out thinking that it had all been studied. But I realized, delving into the literature, it hadn't. So then I realized there was this potential to do something here botanically.

Q: How did you become involved with Fred and Roberta Case?

RN: When I was a graduate student at the University of Michigan, I was fortunate to meet Fred and Roberta Case. They really took me under their wings and were very generous with me, doing things like telling me about certain field locations for various pitcher plant species. I've been in the field with them a few times. So after I had started working on this project of just what is the status of these Gulf Coast pitcher plants, I invited them to work with me. They had independently noticed a lot of the differences I had, so we agreed that we'd work on this together. That's why they're co-authors on the paper.

Q: They had been collecting and growing the species for some time in Saginaw?

RN: Yes, very much so. Their work in the greenhouse was a critical contribution to realizing that *Sarracenia rosea* really is a species distinct from *Sarracenia purpurea* because they had grown both *Sarracenia purpurea* and *Sarracenia rosea* together in the same greenhouse, under the same conditions for years and years. They didn't need much convincing when I said, "Hey, I have evidence that these things are different." So when we put it all together we realized it was a compelling case and that was another reason why I was glad to have them included.

Q: What role did Eric Soper play?

RN: He was an undergraduate when I was doing much of the study here at Northern Kentucky University. He helped by measuring a lot of the specimens. It was nice to have his contributions with all of his diligent work of measuring. He had approached me about doing research and I described various projects to him in which I was engaged, and he seemed to be interested in this one.

Q: When did you realize that this was probably a new species? How long did the study actually last?

RN: Well, I didn't realize—when I was an undergrad—that this plant was any different. It was about 1987 or 1988 when I realized that the plant on the Gulf Coast was different. I earnestly started work on it probably about 1990. In a way it's embarrassing that it took me so long but, on the other hand, it took me a while because I wanted to do a thorough job. First, requesting all those specimens and getting them in from various herbaria, and visiting herbaria; doing the field work and then all the measurements—it just took a long time.

The nice thing about doing all that field work is I was killing two birds with one stone. I was working on the plant but I was also collecting mites and I'm continuing to work both on the botany of *Sarracenia* and the mites.

The mites have been very little studied. People have overlooked them but it ends up they're a major component of this micro-ecosystem. But one of the reasons I'm so interested in them, from the botanical standpoint, is that with many of the *Sarracenia* species being rare I wonder what these arthropods are doing to or for the plants.

There was one study published in the eighties by William Bradshaw from the University of Oregon. He showed that the mosquitoes and the midge larvae that live inside purple pitcher plants actually benefited the plants. When the mosquitoes and

midges were present, the levels of nitrogen inside the pitchers were higher than when the insect larvae were absent. So apparently, these insect larvae, by wriggling through the prey remains, process them and release the nutrients faster.

Well, the mites are present in much higher numbers and they crawl through the prey remains also and they fragment them. I don't have any experimental evidence for this, but I hypothesize that the mites are actually beneficial to the plants too. When I sample populations of the plants I find that the mites are almost always present.

Q. What is your connection with George and Debbie Folkerts?

RN: I know Debbie and she's done a lot of work on the moths. George has been very, very generous with me in sharing his knowledge. So I really have high regard for both of them. In fact, George's paper, in 1982, in *American Scientist*, is one that was really important to my undergraduate research. So I think it's because of George Folkerts, more than any other person, that I am pursuing these things.

Q: What are some features that distinguish *Sarracenia purpurea* from *Sarracenia rosea*?

RN: That's easy. First, the thing to realize is that everything that has been called *Sarracenia purpurea* from the Gulf Coast is this new species. It's the only one there in this group of *Sarracenia*. In other words, *Sarracenia purpurea* does not make it that far south and west. So geography does it.

But that's not very satisfying. If one is fortunate enough to be in the field during the blooming season, *Sarracenia rosea* has pink petals but *Sarracenia purpurea* has maroon petals. The blooming season is quite short so most people would not be there. So there are nice features that are present almost all year round. In terms of the pitchers, the lip of the pitcher in *Sarracenia rosea* is much thicker than the lip of *Sarracenia purpurea*. I give measurements in our paper but generally, just telling people that it's a thicker lip will do it.

Another thing that works very, very well—and this will work most of the year because the plants are in fruit most of the year—is that the flowers and fruits of *Sarracenia rosea* are quite a bit larger than *Sarracenia purpurea* and it becomes especially conspicuous when you look at the relationship of flower size to height of the scape. *Sarracenia rosea* has a large flower but a short flower stalk, or scape. *Sarracenia purpurea* has a relatively small flower but a tall scape (see Figures 1,2).

So these are the most conspicuous differences. We found plenty of others. Generally speaking, all aspects of the flower are larger, including petals. Petals are longer and wider in *Sarracenia rosea*, and the pitchers tend to be larger, though there's a lot of overlap in that. So I really think I gave you the best differences, and the ones that work best in the field as well as in the herbarium.

Q: Are these differences consistent in cultivation?

RN: Yes. That was important to us because we wondered, are some of these things merely ecologic? So take it out of its geographic range and put it with *Sarracenia purpurea*, and does it maintain those distinctions? Yes. It does for these key differences.

Q: How is *Sarracenia rosea* the most “genetically divergent”?

RN: It wasn't the most divergent member of the genus. Mary Jo Godt and Jim Hamrick from the University of Georgia were looking at genetic diversity within the *Sarracenia purpurea* complex. So they had quite a narrow scope, but within that group, the one plant that stood out the most—it was the most different genetically from all the others and that's what we mean by genetically divergent—was *Sarracenia rosea*. The genetic difference between it and the next most genetically closely related member of the *Sarracenia purpurea* complex, was as much as or greater than a lot of investigators have found for separate species. Basically, it was the most different among any of those that they looked at, and they looked at four taxa—*Sarracenia rosea*, the northern *Sarracenia purpurea* subsp. *purpurea*, the mid-coastal *Sarracenia purpurea* subsp. *venosa*, and the mountain *Sarracenia purpurea* subsp. *venosa* var. *montana*.

Q: What about the ranges of *Sarracenia rosea* and *Sarracenia purpurea*?

RN: The thing that worries me is the map that I provide. If one just looks at that they may get a false sense that this plant is more common than it is. For instance, we found herbarium specimens from two populations in Georgia, but those are unknown presently. The plant is most likely extirpated from Georgia and a lot of the mapped locations are gone. So even though the region from the mid-Florida panhandle west to Mississippi is kind of thick with dots on our map, a lot of those dots are no longer there—a lot of those populations are no longer there. I'm very concerned about the conservation of the plant.

Q: In Alabama, is the plant mostly found in Baldwin and Mobile counties?

RN: Yes. Baldwin and Mobile are—in terms of Alabama—the only places where this plant is fairly frequent. It's still a rare plant. So I think we need to be worried about it and I mention in the paper two instances that I myself witnessed of poaching of the plants.

Q: Are the plants well distributed throughout the known sites or do two or three sites have most of the known plants?

RN: That's just what I was going to say, that a lot of the sites I found when I was doing all that field work for all those years and really scouring the areas, I would find five, six, seven, eight, nine, ten, a dozen. Very few sites have what I would call large populations. So I'm hoping the plant is a lot more common than we realize. I think there needs to be a status survey done. But in my experience, even in areas where I know it is and it's good habitat, I don't find much of it.

Q: Are the good sites on public or private lands?

RN: Both. Like two of the best populations I know—one of which is the type locality in the Apalachicola National Forest in Florida. Then, in Alabama, the places I've seen the plant are all private land.



Figure 1: Pressed specimens of *Sarracenia purpurea* (left) and *Sarracenia rosea* (right). Photograph compliments of Robert Naczi.



Figure 2: *Sarracenia rosea* in Florida. Photograph by Barry A. Rice.

Q: Are these burned regularly?

RN: One of the places definitely is.

Q: What is the typical *Sarracenia rosea* habitat like? Is it always found with *Sarracenia leucophylla*?

RN: That's the real indicator. I'm not saying that every place you find *Sarracenia leucophylla*, you find *Sarracenia rosea*. In fact, no. But if *Sarracenia leucophylla* is there one could get out and really look around.

Q: What are the greatest threats?

RN: I really think it's habitat destruction. It's not the over collecting or poaching. I mean those are threats and I'd rank them as serious threats, but the most serious threat, in my experience, is this destruction of habitat because of the rapid development. I myself have seen pitcher plant habitats disappear in the relatively few years that I've been at it. The boom of development, especially right along the coast, is just astounding. So I see that as the worst. Fire suppression, I would say, would be the second most serious threat. Then I would rank poaching as the third most serious threat. Again, we need a status survey but, in my experience, those are the most serious threats prioritized.

Q: How do other workers feel about recognizing *Sarracenia rosea* as a distinct species?

RN: I know there will always be differences of opinion. There will be a lot of people who'll say I'm just a splitter or I just wanted to describe a new species. I think the best way to go is to document diversity and I think if we don't recognize something that's truly distinct as a species, we do an injustice to it because, especially for conservation purposes, these things don't get as much priority when they're varieties or subspecies as when they're species. In my opinion we provide many reasons why this is distinct as a species: the morphology, we cite the genetic work of Godt and Hamrick, we have the greenhouse common growth experiments that the Cases did. I know people will disagree with me. The best I can do is lay my cards on the table, show the evidence of it, and let people make their decisions.

Papers mentioned in this interview:

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